

HAND EXERCISERS

FIELD OF THE INVENTION

The present invention relates to a hand exerciser having a loop with a plurality of rings rotatably mounted to the loop. The rings are rotated relative to the
5 loop and are maintained at a position by rotating the loop.

BACKGROUND OF THE INVENTION

A conventional hand exerciser is shown in Fig. 8 and generally includes a handle 10 which has a rope 11 connected thereto and a ball 12 is connected to a distal end of the rope 11. The ball 12 includes a plurality of holes 120. A tip end 14
10 extends from an end of the handle 10 and two cups 13 are connected radially to the handle 10. The user throws the ball 12 and tries to let the tip end 14 penetrate through one of the holes 120 of the ball 12. Alternatively, the user may catch the ball 12 by the cups 13. This requires a lot of coordination efforts to successfully catch the ball 12 so that most of the users are frustrated by frequent failures.

15 The present invention intends to provide a hand exerciser that the user has to rotate the loop and requires skill to keep the rings on their positions on the loop.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention, there is provided a hand exerciser which comprises a loop having a smooth outer periphery and
20 extending through a hole in each of rings which are rotatable relative to the loop.

The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show,

for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view to show the hand exerciser of the present invention;

Fig. 2 shows the rings are rotatable about the loop;

Fig. 3 shows the rings have eccentric holes and are rotatable about the loop;

Fig. 4 shows that the rings have polygonal outer peripheries;

Fig. 5 shows the user holds the loop and rotates the rings when using the hand exerciser;

Fig. 6 shows the components of force applied to the loop and the rings;

Fig. 7 shows the force analysis of the rings at different positions on the loop, and

Fig. 8 shows a conventional hand exerciser.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figs. 1 and 2, the hand exerciser of the present invention comprises a loop 20 having a smooth outer periphery and a plurality of rings 30 each have a hole 31 defined therethrough and the loop 20 extends through the hole 31 of each ring 30. An inner diameter of the hole 31 of each ring 30 is 1.5 times of an outer diameter of the loop 20 so that the rings 30 are rotatable relative to the loop 20. As shown in Fig. 5, when using the hand exerciser, one hand holds the loop 20 and the other hand rotates the rings 30 so that the rings 30 are rotatable about the loop 20.

During the rotation of the rings 30, as shown in Fig. 6, the inner periphery of each ring 30 is in contact with the loop 20 so as to shake or vibrate the loop 20 and therefore exercises the hand holding the loop 20.

As shown in Figs. 6 and 7, during the rotation, the gravity "B" of each ring 30 is composed of two component forces "X" and "Y". If the eccentric force "D" of the rotation of the rings 30 designated by the arrow A1 at an upper position on the loop 20 is less than the component force "Y", the ring 30 cannot be maintained at that position and will drop to the bottom of the loop 20. When the eccentric force "D" of the rotation of the rings 30 designated by the arrow A2 at the section included by two dotted lines in Fig. 7 is equal to the component force "Y" and in opposite directions, the ring 30 can be maintained at that position. When the eccentric force "D" of the rotation of the rings 30 designated by the arrow A3 at the lower position applies in the same direction as the component force "Y", the ring 30 will drop to the bottom of the loop 20.

When the user rotates the loop 20, there is a frictional force "C" between the rings 30 and the loop 20 and the direction of the frictional force "C" is shown in Fig. 7 so that the rings 30 moves upward. If the frictional force "C" is larger than the component force "X" of the ring 30, the ring 30 moves upward along the loop 20. On the contrary, if the frictional force "C" is less than the component force "X" of the ring 30, the ring 30 moves downward along the loop 20. If the frictional force "C" is the same as the component force "X" of the ring 30, the ring 30 is maintained at the position. Therefore, the user has to rotate the loop 20 at a proper speed to maintain the position of the rings 30 between the two dotted lines.

As shown in Fig. 3, the hole in each ring 30 can be an eccentric hole 300 defined through each of the rings 30 such that the force that hits the loop 20 is different from the embodiment as described above. As shown in Fig. 4, the ring 30 may have a polygonal outer periphery. The rings 30 may have a sound generating member or light emitting member so as to increase the entertainment features.

While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.